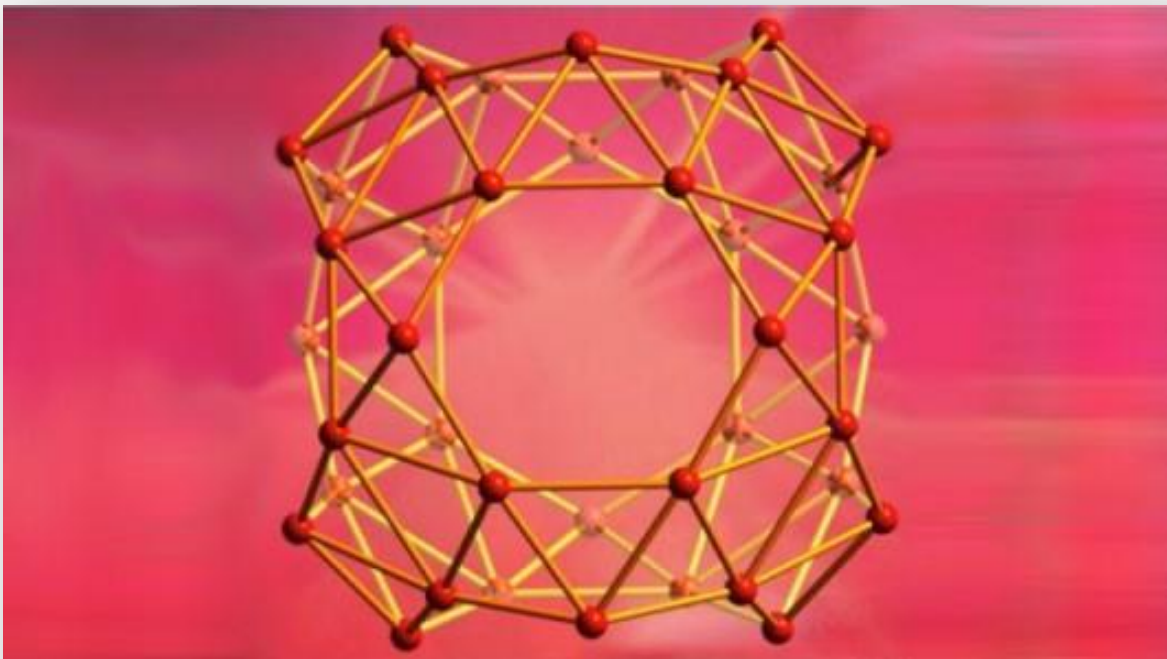


Science Breakthroughs The Koyal Group InfoMag reviews: Nanotech Discovery



Boron Buckyball Structure Discovered

Nanotechnology was advanced massively after the discovery of the original Buckyball in 1985

Scientists working with different molecular structures of Boron have discovered a configuration that resembles the Buckminsterfullerene, often referred to as the Buckyball, a structure that has become extremely important in the development of nanotechnology. The new material is just as hollow as the Buckball and could also have important implications in the development of nanotech.

The research was carried out by scientists from Brown University, along with colleagues in Shanxi University and Tsinghua University in China. Their **discovery** could have a

profound impact on the future of nanotechnology, but for now there is no obvious usage for the molecular structure they discovered.

Endless combinations achieve result

There has been a theoretical model for a boron molecule with similar properties to the Buckyball, but it had not been observed in experiments until the work by these researchers. The research involved the computer modelling of over 10,000 structures of Boron, identifying each by its binding energy. The energies of actual molecules were then tested using a process called photoelectron spectroscopy, allowing the structures to be identified.

The experiment returned two 40-atom structures formed by Boron. The first is the aforementioned ball-shaped cluster. The second is described as a semi-flat molecule by the researchers. The boron ball is of the most importance because of the theoretical model that has pointed to it for years, and the fact that it resembles the Buckyball, the progenitor of so many nanotechnology discoveries.

The 40-atom hollow structure is being called a borospherene by the scientists that discovered it. A paper concerning its discovery and the experiments that led to it, appears in the scientific journal Nature Chemistry.

Buckyball: New material may lead to new discoveries

The Buckminsterfullerene was discovered in 1985 and gave rise to much of nanotechnology's foundation. The structure spurred the [search and discovery](#) of other forms of carbon with unusual properties. Carbon nano-tubes, a science fiction answer to many of the world's problems and graphene, a thin layer of carbon with incredible strength, that has been touted as one of the materials that will define the twenty-first century, were both discovered immediately after the Buckminsterfullerene.

Lai-Sheng Wang, a professor of chemistry at Brown University, was one of those who led the research. He has no idea about the applications of the molecule, but is proud of the achievement, and excited by it, in and of itself. According to the researcher, "As a chemist, finding new molecules and structures is always exciting. The fact that boron has the capacity to form this kind of structure is very interesting."

"Of course if it turns out to be useful that would be great, but we don't know yet. Hopefully this initial finding will stimulate further interest in boron clusters and new ideas to synthesize them in bulk quantities." Nanotechnology is still a very young science and discoveries like this one may help to form the basis for many discoveries later on. Just as the Buckball spurred the discovery of incredible carbon structures, the borospherene may allow nanotechnology to expand its purview.